IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

EVOLVED WIRELESS, LLC,) Plaintiff,) v.) APPLE INC.,) Defendant.)	C.A. No. 15–cv-542–SLR-SRF
EVOLVED WIRELESS, LLC,) Plaintiff,) v.) HTC CORPORATION and HTC AMERICA, INC.,) Defendants.)	C.A. No. 15–cv-543–SLR-SRF
EVOLVED WIRELESS, LLC,) Plaintiff,) v.) LENOVO GROUP LTD., LENOVO (UNITED STATES) INC., and MOTOROLA MOBILITY,) Defendants.)	C.A. No. 15–cv-544–SLR-SRF
EVOLVED WIRELESS, LLC,) Plaintiff,) v.) SAMSUNG ELECTRONICS CO., LTD. and SAMSUNG ELECTRONICS AMERICA, INC.,) Defendants.)	C.A. No. 15–cv-545–SLR-SRF

EVOLVED WIRELESS, LLC,	)
	)
Plaintiff,	)
	)
v.	)
	) C.A. No. 15–cv-546–SLR-SRF
ZTE CORPORATION, ZTE (USA) INC.,	)
and ZTE SOLUTIONS INC.,	)
	)
Defendants.	)
	)

PLAINTIFF EVOLVED WIRELESS, LLC'S ANSWERING BRIEF IN OPPOSITION TO DEFENDANTS' MOTION FOR JUDGMENT ON THE PLEADINGS

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I.   **INTRODUCTION**

As this Court recently recognized given the state of the case law, "the § 101 analysis

should be, and is, a difficult exercise."[1] This exercise is made more difficult, however, when the

Defendants ignore the applicable case law and distort the patent claims at issue. The '916 and

'481 Patents are narrowly directed to improved systems and methods for generating and

transmitting code sequences in a wireless communication system. The Defendants ignore the

Supreme Court's decision in *Diamond v. Diehr* holding that inventions applying mathematical

formulas to specific applications are patent-eligible, and the Defendants' silence is deafening. As

this Court has consistently found, "'an application of a law of nature or mathematical formula to

a known structure or process may well be deserving of patent protection,' so long as that

application would not preempt substantially all uses of the fundamental principle."[2]

Instead of reading the patent claims as a whole, the Defendants overgeneralize the claims,

alleging that the patents broadly cover "the transmission of anything, from a code sequence to

the common cold." The '916 and '481 Patents do not claim broad mathematical concepts limited

to a particular field of use to maintain patentability as Defendants allege, nor do the claims relate

to the transmission of viral infections. Instead, the patents claim specific systems and methods

for generating and transmitting code sequences in wireless communications, including the

application of specific mathematical operations. As is clear from the specificity of the claims

themselves, the patents do not pre-empt all uses of the mathematical operations, nor preempt all

code sequence lengths transmitted using the mathematical operations, and are patent eligible.

The Defendants urge this Court to ignore substantial claim limitations and find that based

on broad generalizations about the "heart and soul" of the challenged patents, nothing is left but

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[1] *Intellectual Ventures I, LLC v. Ricoh Americas Corp.*, No. 13-474-SLR, 2016 U.S. Dist. LEXIS 36875, at *16 (D. Del. Mar. 22, 2016).
[2] *Id.* at *5.

a patent-ineligible mathematical formula. The Supreme Court explicitly rejected this approach in *Diehr*, a case *not* addressed by the Defendants. Similar to the claims incorporating mathematical formulas held patentable in *Diehr*, the claims at issue here are limited to a specific implementation of mathematical operations to generate and transmit code sequences particular to wireless communications. As such, the '916 and '481 Patents are patent eligible under § 101.

II.   NATURE AND STAGE OF THE PROCEEDINGS

On June 25, 2015, Evolved Wireless filed these patent infringement suits alleging infringement of five patents essential to Long Term Evolution ("LTE") wireless communication standards, including U.S. Patent Nos. 7,746,916 (the "'916 Patent") and 8,218,481 (the "'481 Patent"). D.I. 1 ¶ 15.[3] Five of the six defendants answered the Complaint in September 2015. *See, e.g.*, D.I. 9. Opening, supplemental, and answering claim construction briefs were submitted on June 16 (D.I. 60), July 8 (D.I. 65), and August 12, 2016 (D.I. 73), and the claim construction hearing is scheduled for October 6, 2016. *See* D.I. 63, 67. On August 10, 2016, more than one year after the Complaint, the Defendants filed their Rule 12(c) motion under § 101.

III.   SUMMARY OF ARGUMENTS

1.   The '916 and '481 Patents claim specific improvements to wireless communication technologies that address problems unique to the field. None of the asserted claims preempt any mathematical operations. Rather, the claims are limited to generating and transmitting code sequences in a wireless communication system using certain mathematical operations that offer tangible improvements to the system. Thus, the claims include specific limitations to place meaningful boundaries sufficient to confer patent eligibility and do not claim an abstract idea.

2.   Under step two of *Alice*, the claims contain an inventive concept that confers patent eligibility. The claims are tied to specific steps and machines necessary to perform the claimed

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[3] For ease of reference, docket item citations refer to related case C.A. 15-cv-542-SLR-SRF.

functions and meet both prongs of the machine or transformation test.

IV.   COUNTERSTATEMENT OF FACTS

The '916 and '481 Patents are standard-essential patents necessary to allow mobile devices to use LTE wireless communications systems. D.I. 1 ¶ 15. The patents-in-suit are a result of substantial contributions to solve significant technical challenges associated with the wireless technology underlying the LTE standards. *Id.* ¶ 16.; *see generally id.* ¶¶ 9-11. The '916 and '481 Patents are "rooted in mobile telecommunications technology and solve[] particular problems arising in wireless cellular communications between mobile devices and cellular networks." *Id.* ¶ 24. As discussed by the specifications, the patents claim "specific solutions to improve mobile device functionality over the prior art with faster, more reliable, and more efficient voice and data transmissions." *Id.* ¶ 25. Thus, the patents claim eligible subject matter under § 101.

A.   '916 Patent

The '916 Patent claims specific systems and methods for generating and transmitting code sequences in wireless communications that overcome limitations rooted in the prior art. As the patent specification explains, "a pilot signal or preamble of a wireless communication system is referred to as a reference signal used for initial synchronization, cell search, and channel estimation. Further, the preamble is comprised of a code sequence, and the code sequence is further comprised of orthogonal or quasi-orthogonal [codes] which represent good correlation properties." D.I. 1-1 at 1:20-26. The patent further describes problems associated with prior art code sequences. "Although the [Hadamard] code sequence and a poly-phase Constant Amplitude Zero Auto-Correlation (CAZAC) code sequence are orthogonal codes, [the] number of codes used to maintain orthogonality is limited." *Id.* at 1:31-34. "Accordingly, the ['916 Patent] is directed to a method and apparatus for generating and transmitting code sequence[s] in a wireless communication system that substantially obviates one or more problems due to limitations and

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disadvantages of the related art." D.I. 1-1 at 1:51-55.

The '916 Patent claims specific systems and methods to generate and transmit code sequences of a desired length, L. As illustrated in Figure 13, claim 1 requires generating a sequence of a second length L by a cyclic extension of a code sequence with a first length X, where X equals "a largest prime number smaller than the second length." D.I. 1-1 at 17:44. The cyclic extension is performed where a portion of the sequence with length X is added to the start or end of the sequence—the final sequence length L is equal to X plus the cyclic extension. *Id.* at 17:46-50. Further, the cyclically extended sequence is circularly shifted such that a rear portion of the sequence is shifted to the front, or a front portion of the sequence is shifted to the rear. *Id.* at 17:52-58. As the patent explains, transmitting the claimed code sequences provides specific benefits to wireless communications by increasing the amount of control information transmitted to a communication system while still maintaining the desired cross-correlation properties. *Id.* at 11:22-42. In addition, the transmitted code sequences according to the inventions of the '916 Patent further maximize the number of available code sequences concurrently used in a wireless communication system by reducing interference with other transmitted code sequences, providing tangible benefits to the wireless network. *Id.* at 7:35-44, 8:13-23; 8:44-51.

The asserted dependent claims add additional specific limitations that provide further improvements over the prior art. Claim 2 requires that a portion of the code sequence of length X comprises a cyclic prefix or a cyclic postfix, *id.* at 17:58, claim 4 requires the sequence X to be a Zadoff-Chu sequence, *id.* at 18:1, and claim 5 requires that the sequence is transmitted as a reference signal sequence. *Id.* at 18:4. Claims 6 through 10 describe apparatuses capable of generating and transmitting the improved sequences with a "code sequence generator" and a "transmitting unit." *Id.* at 18:7-43. From the language of the claims, they do not preempt cyclic

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extensions and circular shifts, nor do they preempt all code sequence transmissions using these broad operations. Instead, the claims are limited to generating and transmitting code sequences in a wireless communication system with specific sequence lengths using specific operations.

B.   '481 Patent

The '481 Patent claims systems and methods for generating and transmitting a specific type of code sequence—a *preamble sequence*—in a specific manner—over a random access channel within a mobile communication system. D.I. 1-5 at 18:33-43. As explained in the specification, mobile devices (referred to as "user equipment") utilize a preamble transmitted over a random access channel to access the network when the device is not yet synchronized with the base station, such as when the device is first turned on or after coming out of an idle state. *Id.* at 1:24-30; 4:55-5:3. The specification identifies several problems with preamble sequence transmission in the prior art that the invention sought to overcome.

Specifically, the patent describes five prior art methods and the associated problems for "transmitting data from a random access channel by using the CAZAC sequence." *Id*. at 1:45-2:33; D.I. 1 ¶¶ 54-59. As an improvement, "the present invention has been suggested to substantially obviate one or more problems due to limitations and disadvantages of the related art, and an object of the present invention is to provide a method of transmitting and receiving message[s] between a user equipment and a base station by using a long sequence to maximize time/frequency diversity and alleviat[e] performance attenuation due to channel." D.I. 1-5 at 2:37-44. "Another object of the present invention is to provide a method of transmitting data through a code sequence in a mobile communication system, in which the quantity of data can be increased and the transmitted data becomes robust to noise or channel change." *Id*. at 2:45-49.

The inventions of the '481 Patent require the generation and transmission of a specific preamble sequence constructed from repeating consecutive sequences and adding a single cyclic

prefix, as shown in Figure 11. Transmitting the claimed preamble sequence "compensate[s] a multi-path loss in signal transmission" and "is advantageous in that it is easy to identify user equipments which access different RACHs." *Id.* at 11:55-67. The resulting transmitted preamble allows for better reception of the preamble at the base station. *Id.* at 12:5-10.

The asserted dependent claims add additional structure or steps that provide further improvements. Claim 2 requires that the repeated sequence of the transmitted preamble sequence is "a Constant Amplitude Zero Auto Correlation (CAZAC) sequence." *Id.* at 18:43-45. As the patent explains, CAZAC sequences exhibit "excellent transmission characteristics" that provide additional benefits to LTE systems. *Id.* at 9:12-15. Claim 3 adds the additional step of applying a cyclic shift to the CAZAC sequence. *Id.* at 18:46-48. Cyclically shifted CAZAC sequences are orthogonal to each other, enabling a cell tower to differentiate between code sequences transmitted by different mobile devices. Claims 4 and 6 recite methods of applying the cyclic shift of claim 3. *Id.* at 18:46-51. Asserted claims 8-11 and 13 are directed toward transmitters configured to use the inventive sequence transmission methods with a "preamble generation unit" and a "transmission unit." *Id.* at 18:60-20:4. Similar to the claims of the '916 Patent, the claims of the '481 Patent do not preempt cyclic prefixes, nor do they prevent all code sequence transmissions from using a cyclic prefix. Instead, the claims cover a specific iteration of a specific code sequence type: a "preamble sequence" transmitted on a "random access channel" with a repeated sequence portion N*L and a single cyclic prefix added to the front.

V.   ARGUMENT

A.   The Defendants ignore the Supreme Court's decision in *Diehr* holding specific applications of mathematical formulas are patent-eligible.

The Defendants urge this Court to invalidate each of the eighteen asserted claims of the '916 and '481 Patents based on the Supreme Court's decisions in *Benson* and *Flook*. The

Defendants ignore the Supreme Court's subsequent decision in *Diamond v. Diehr* finding that inventions claiming specific applications of mathematical formulas are patent eligible. A comparison of these cases shows that the claims of the '916 and '481 Patents are valid.

In *Gottschalk v. Benson*, the Supreme Court affirmed the U.S. Patent and Trademark Office's decision to reject a patent application which sought to patent "a method for converting binary-coded decimal (BCD) numerals into pure binary numerals." 409 U.S. 63, 64 (1972). Significantly, the method claims at issue "were not limited to any particular technology, to any particular apparatus or machinery, or to any particular end use." *Id.* Rather, "[t]hey purported to cover any use of the claimed method in a general-purpose digital computer of any type." *Id.*

Indeed, the Court found that the claims were not tied to any particular machine and were "so abstract and sweeping as to cover both known and unknown uses" of the mathematical algorithm. *Id.* at 68. The Court also noted that the "mathematical procedures can be carried out in existing computers long in use, no new machinery being necessary. And, as noted, they can also be performed without a computer." *Id.* at 67. In addition, "[t]he mathematical formula involved [had] no substantial practical application except in connection with a digital computer." *Id.* at 71. Thus, "the patent would wholly pre-empt the mathematical formula and in practical effect would be a patent on the algorithm itself," and the Court affirmed the USPTO's rejection. *Id.* at 72.

In *Parker v. Flook*, the Court again affirmed the USPTO's rejection of method claims which sought to patent a "formula for computing an updated alarm limit." 437 U.S. 584, 586 (1978). The Court observed that the claimed method "consists of three steps: an initial step which merely measures the present value of the process variable (e.g., the temperature); an intermediate step which uses an algorithm to calculate an updated alarm limit value; and a final step in which the actual alarm limit is adjusted to the updated value." *Id.* at 585. Like the patent

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application at issue in *Benson,* the proposed claims in *Flook* were not tied to any particular apparatus or machinery. In fact, the Court observed that the claimed computations "can be made by pencil and paper calculations." *Id.* at 586. The Court also observed that "[t]he patent claims cover *any use* of respondent's formula for updating the value of an alarm limit on *any process* variable involved in a process comprising the catalytic chemical conversion of hydrocarbons. *Id.* (emphasis added). The patentee tried to distinguish *Benson* by arguing the claimed method was limited to catalytic chemical conversions and thus was not a patent on the mathematical formula itself. *Id.* at 593. The Court disagreed, using the point-of-novelty approach to ignore all claim limitations found in the prior art, with nothing left beyond the formula itself. *Id.* at 594. The Court stressed the patent contained no specific disclosures "relating to the chemical processes at work, the monitoring of process variables, or the means of setting off an alarm or adjusting an alarm system. All that it provides is a formula for computing an updated alarm limit." *Id*. at 586

In *Diehr*, the Supreme Court subsequently rejected *Flook*'s point-of-novelty approach and held that "claims must be considered as a whole." 450 U.S. 175, 188 (1981). In contrast to its prior holding in *Flook*, the Court explained: "It is inappropriate to dissect the claims into old and new elements and then to ignore the presence of old elements in the analysis." *Id.* "[A] new combination of steps in a process may be patentable even though all the constituents of the combination were well known and in common use before the combination was made." *Id* "The 'novelty' of any element or steps in a process, or even of the process itself, is of *no relevance* in determining whether the subject matter of a claim falls within the § 101 categories of possibly patentable subject matter." *Id*. at 188-89 (emphasis added). Applying this holistic approach, the court found that specific applications of mathematical formulas are patent eligible. *Id.* at 192-93.

The specific claims at issue in *Diehr* claimed an improvement over prior art methods to

calculate rubber cure time that could not control for unknown temperature shifts inside the rubber press and often under or overestimated cure time. *Id.* at 177-78. The invention required constantly measuring rubber temperature inside the mold and using a mathematical formula to recalculate cure time. *Id.* Specifically, the claims required "installing rubber in a press, closing the mold, constantly determining the temperature of the mold, constantly recalculating the appropriate cure time through the use of the formula and a digital computer, and automatically opening the press at the proper time." *Id.* at 187. The Court distinguished these limitations from the broad patent claims addressed in *Benson* and *Flook* because the claim did not pre-empt a mathematical formula (*Benson*) to a particular field of use (*Flook*), but instead claimed only the use of a mathematical formula in a specific method to cure rubber. *Id.* at 192. Like the claims found eligible by the Supreme Court in *Diehr*, the claims of the '916 and '481 Patents are limited to specific improvements to generate and transmit code sequences in wireless communications.

B.   The Defendants have failed to demonstrate that any asserted claims of the '916 and '481 Patents are invalid under § 101.

Under this Court's precedent, § 101 issues are analyzed under *Alice* with three distinct questions in mind: "At step one of the *Alice* analysis, [1] the claims (informed by the specification) must describe a problem and solution rooted in computer technology and [2] the solution must be specific enough to preclude the risk of pre-emption. [3] At step two, the claimed solution must be innovative enough to 'override the routine and conventional' use of the computer." *Device Enhancement, LLC v. Amazon.com, Inc.*, No. 15-762-SLR, 2016 U.S. Dist. LEXIS 64600, at *16 (D. Del. May 17, 2016). The Defendants bear the burden by clear and convincing evidence to prove the patents are invalid. *See Intellectual Ventures I, LLC v. Motorola Mobility LLC*, 81 F. Supp. 3d 356, 360 (D. Del. 2015). The Defendants have failed to meet this burden, and as shown below, the patents pass this Court's § 101 analysis.

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     1.   **The '916 and '481 Patent claims describe specific problems and solutions rooted in wireless communication systems.**

The '916 and '481 Patents do not claim abstract ideas under the first step in *Alice*. The

patents claim a specific improvement directed to solving prior art problems with generating and

transmitting code sequences in a wireless communication system. As the Federal Circuit recently

noted in *Enfish, LLC v. Microsoft Corp.*, not "all improvements in computer-related technology

are inherently abstract." 822 F.3d 1327, 1335 (Fed. Cir. 2016). "Nor do we think that claims

directed to software, as opposed to hardware, are inherently abstract and therefore only properly

analyzed at the second step of the *Alice* analysis. Software can make non-abstract improvements

to computer technology just as hardware improvements can . . . ." *Id.* Thus, the first step in *Alice*

"asks whether the focus of the claims is on the specific asserted improvement in computer

capabilities [or other technological processes] . . . or, instead, on a process that qualifies as an

'abstract idea' for which computers are invoked merely as a tool." *Id.* at 1336; *see also DDR*

Holdings LLC v. Hotels.com, L.P., 773 F.3d 1245, 1257 (Fed. Cir. 2014) (finding claims "rooted

in computer technology in order to overcome a problem specifically arising in the realm of

computer networks" eligible under § 101 where "they do not merely recite the performance of

some business practice known from the pre-Internet").

     Similar to the claims upheld in *Enfish* and *DDR*, the '916 and '481 Patents do not claim

"general-purpose computer components . . . added post-hoc to a fundamental economic practice

or mathematical equation," but instead claim "a specific implementation of a solution to a

problem" in the realm of wireless communications. *See Enfish*, 822 F.3d at 1339. For example,

by generating and transmitting the code sequences as claimed in the '916 Patent, the number of

unique code sequences is optimized while maintaining good cross-correlation properties between

the sequences, decreasing system interference and increasing the number of mobile devices

serviced by each base station. D.I. 1-1 at 1:31-34; 7:35-44, 8:13-23. The '481 Patent also describes specific problems with reception of preamble sequences in prior art systems, particularly in large cell environments. *See* D.I. 1-5 at 2:37-44. Generating and transmitting the claimed code sequences "compensate[s] a multi-path loss in signal transmission" and "is advantageous in that it is easy to identify user equipments which access different RACHs," *id.* at 11:55-67, allowing for better reception of the transmitted preamble. *Id.* at 12:5-10. Thus, the plain focus of the claims is the improvement of wireless communication technologies, and the claims are patent-eligible under § 101. *See Enfish*, 822 F.3d at 1336 (finding patent eligibility where "the plain focus of the claims is on an improvement to computer functionality itself, not on economic or other tasks for which a computer is used in its ordinary capacity").

The '916 and '481 Patent claims are also similar to those claims found patentable by this Court in *Intellectual Ventures I, LLC v. Ricoh Americas Corp.*, which addressed claims directed at "an image scanning method that can improve the image scanning rate." No. 13-474-SLR, 2016 U.S. Dist. LEXIS 36875, at *19 (D. Del. Mar. 22, 2016). In *Ricoh*, the defendant argued that the patent-at-issue "simply claims an unpatentable mathematical formula used in a generic prior art scanner" that could be performed mentally or with a pen and paper. *Id.* at *21. This Court found that because the claims include first "determining the parameters (which meet a certain mathematical formula)" and then "applying such parameters to operate a scanner," the claims "do not claim the mathematical formula nor do they seek to simply 'implement' such a formula." *Id.*; *see also Comcast Cable Commc'ns, LLC v. Sprint Commc'ns Co.*, No. 12-859, 2016 U.S. Dist. LEXIS 113726, at *72-74 (D. Del. Aug. 24, 2016) (finding claims that solve "a specific problem in prior art cellular networks" patent-eligible); *Improved Search LLC v. AOL Inc.*, No. 15-262-SLR, 2016 U.S. Dist. LEXIS 36882, at *26-27 (D. Del. Mar. 22, 2016). In both *Ricoh*

and *Improved Search*, this Court found the claims valid because they were directed not to the

formula itself, but a specific application of the formula rooted in the art. Similarly, the claims of

the '916 and '481 Patents apply a specific application of the claimed mathematical operations to

transmit code sequences in a wireless communication system and are patent eligible.

> **a.   The Defendants improperly overgeneralize the claims to find nothing left but a mathematical formula.**

The Defendants ask this Court to ignore the clear direction of *Diehr* to view the challenged

claims as a whole, and instead find that the "heart and soul" of the claims is "directed to a

mathematical algorithm for generating a code sequence." D.I. 72 at 10. The Defendants also

argue that because the asserted method claims refer to the transmitting mobile device as a

"transmitting party" and the receiving cell tower as a "receiving party,"[4] the claims relate to "the

transmission of anything, from a code sequence to the common cold." This complete

overgeneralization ignores not only the plain language of the claims, but also ignores the

disclosures in the specification. For example, the method claims require transmitting a "code

sequence" in a "wireless communication system," not the common cold. Further, the apparatus

claims require a "code sequence generator" and a "transmitting unit," known structures in a

wireless communication system. Similarly, the '481 Patent claims transmitting a code sequence

in a "mobile communication system"—specifically a "preamble sequence" over a "random

access channel"—and the apparatus claims require a transmitter with a "preamble generation

unit" and a "transmission unit." These limitations do not relate to transmitting a virus like the

common cold, and the Defendants' overgeneralization compels denial of their motion.

The Defendants argue that because transmitting code sequences was known in the prior art,

the limitations amount to nothing more than "insignificant post-solution activity at best" and

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[4] The method claims of the '916 and '481 Patent claim a "receiving party" or a "receiving side," respectfully, while only the '916 Patent claims a "transmitting party."

"such language cannot bring the claimed mathematical algorithm within the ambit of Section 101." *Id.* at 12. The Defendants' arguments misconstrue the claims at issue and the relevant case law. Ignoring the transmission steps eviscerates the scope of the inventions, precisely what the Supreme Court cautioned against in *Diehr*. As informed by the specification, and when viewed as a whole, the claims of the '916 and '481 Patents are limited to generating and transmitting improved code sequences that offer tangible benefits to wireless communication systems and are not patents on bare mathematical formulas as the Defendants suggest. At the very least, the Defendants raise a fact issue as to whether a person of ordinary skill in the art would recognize that the specific narrowing limitations of the method claims—"transmitting the circular shifted code sequence" ('916 Patent) and "transmitting, on a random access channel, said preamble sequence" ('481 Patent)—or the claimed components of the apparatus claims do not limit the claims and are broad enough to cover the transmission of the common cold.

In fact, the Supreme Court itself cautioned against overgeneralizing claims, finding that "[a]t some level, 'all inventions . . . embody, use, reflect, rest upon, or apply laws of nature, natural phenomena, or abstract ideas.'" *Alice Corp. Pty. Ltd. v. CLS Bank Int'l*, 134 S. Ct. 2347, 2354 (2014). Indeed, under the Defendants' analysis, *no* technology patent could ever claim an improvement as patent-eligible subject matter based on novel and specific applications of mathematical formulas. This argument has been explicitly rejected by both the Supreme Court in *Diehr* and the Federal Circuit in *DDR* and *Enfish*, as well as by this Court in *Ricoh Americas Corp.*, and the Defendants do not cite to any case supporting this broad proposition.

        b.   **The claims of the '916 and '481 Patents are easily distinguished from the cases cited by the Defendants to show an abstract idea under *Alice*.**

The cases cited by the Defendants under step one involved patent claims related to fundamental ideas such as organizing human activity. For example, the claims in *In re TLI*

Commc'ns LLC Patent Litig. were directed at "classifying and storing digital images in an organized manner," an abstract idea. 823 F.3d 607, 609 (Fed. Cir. 2016); *see also Intellectual Ventures I LLC v. Capital One Bank (USA)*, 792 F.3d 1363, 1367-72 (Fed. Cir. 2015) (finding patents directed at automatic budgeting, digital image storage, and customized webpage interfaces directed at abstract idea); *Cyberfone Sys., LLC v. CNN Interactive Grp., Inc.*, 558 F. App'x 988, 991 (Fed. Cir. 2014) (finding claims for capturing and storing data on a telephone directed to abstract idea); *buySAFE v. Google, Inc.*, 765 F.3d 1350, 1353 (Fed. Cir. 2014) (finding claims for guaranteeing online commercial transactions an abstract idea); *Visual Memory LLC v. Nvidia Corp.*, No. 15-789-RGA, 2016 U.S. Dist. LEXIS 69543, at *10 (D. Del. May 27, 2016) (finding claims directed to tiered data storage an abstract idea); *OpenTV, Inc. v. Apple, Inc.*, No. 14-cv-1622-HSG, 2015 U.S. Dist. LEXIS 44856, at *15 (April 6, 2015) (finding claims directed at associating confidential information with unique identifiers an abstract idea).

These and other patents often find corollaries to human activity before the rise of the internet, or before the rise of computers, similar to mental processes that can be performed in the human mind or on pen or paper. *See Visual Memory LLC*, 2016 U.S. Dist. LEXIS 69543, at * 10 ("Humans have categorized data for many years."); *see, e.g.*, *Elec. Power Grp., LLC v. Alstom S.A.*, No. 2015-1778, 2016 U.S. App. LEXIS 13861, at *7-8 (Fed. Cir. Aug. 1, 2016) (collecting abstract idea cases where patents were directed to one of (1) collecting information, (2) analyzing information by steps performed in the human mind, or (3) presenting the results as an ancillary part of such collection and analysis, without more). None of these cases relate to the inventions claimed in the '916 and '481 Patents and are distinguishable from this case.

The claims of the '916 and '481 Patents do not collect, analyze, or display information, nor do they claim a longstanding commercial practice made more efficient by implementing on a

computer. As the Defendants themselves describe, the patents are related to "modulating and transmitting telecommunication signals" ('916 Patent), *see* D.I. 72 at 2, or generating and transmitting a preamble sequence on a random access channel ('481 Patent). *See id.* at 7. The Defendants have not alleged, nor can they, that the claimed generation and transmission of code sequences in a wireless communication system can be performed on pen or paper, or in the human mind. Indeed, the patents claim specific solutions to unique problems arising in the realm of wireless communication systems and are not directed to abstract ideas.

> **2.   The specifically claimed solutions of the '916 and '481 Patents eliminate any risk of preemption.**

Under step one of *Alice*, this Court looks at the specific solution to determine if the claims "preclude the risk of preemption." *Device Enhancement,* 2016 U.S. Dist. LEXIS 64600, at *17. Despite this Court's guidance, the Defendants do not substantively address preemption and improperly ignore specific limitations in the claims. Clearly, the language of the claims shows they do not wholly preempt the use of mathematical formulas as the Defendants allege. Instead, the method claims are limited to generating and transmitting code sequences in a wireless or mobile communication system using specific applications of mathematical operations that provide tangible benefits to the system, and the apparatus claims require specific components capable of performing the methods, including a "code sequence generator" and a "transmitting unit" ('916 Patent) and a "preamble generator unit" and a "transmission unit" ('481 Patent).

Further, the plain language of the claims also shows that not all code sequence transmissions using the mathematical operations are preempted. Claim 1 of the '916 Patent requires generating and transmitting a code sequence of length L by cyclically extending a sequence of length X, where X is equal to the largest prime number smaller than L, and where the cyclic extension adds a portion of sequence X to either the front or the rear of the sequence.

D.I. 1-1 at 17:35-58. The claims do not wholly preempt the mathematical operations, do not preempt all code sequence transmissions, and do not preempt all transmitted code sequences using the claimed operations. A code sequence of length L generated by a cyclic extension of a sequence less than length X (the largest prime number smaller than L) is not preempted, for example. An extension of the base sequence of length X that is not the claimed cyclic extension, i.e. adding a portion of the sequence of length X to the rear or the front, is also not preempted, such as adding a portion of the sequence in the middle of the sequence to reach length L.

Similarly, claim 1 of the '481 Patent requires generating and transmitting a specific sequence type, a "preamble sequence," over a "random access channel." D.I. 1-5 at 18:33-42. The sequence is generated by repeating a specific sequence of length L N times, where the repeated sequences have a length (N*L), and adding a cyclic prefix to the front. *Id.* Thus, not all sequence types generated using the claimed methods are preempted, only "preamble sequences" sent over a "random access channel." As the Defendants' own brief shows, the random access channel is a specific "transmission channel in prior art communication systems." Other transmission channels are not preempted, such as the broadcast channel (BCH), synchronization channel (SCH), or downlink control channel identified by the '481 Patent. *See* D.I. 1-5 at 7:5-9; 16:58-65. Given these detailed claim limitations, the Defendants cannot show that the claims are not "specific enough to preclude the risk of pre-emption" under this Court's § 101 precedent.

Despite the increasing specificity in the dependent claims, the Defendants misguidedly urge the Court to ignore the additional limitations because they were known in the art, or because they refine the mathematical operations. The dependent claims further eliminate the preemption risks, however, and claim 1 is not representative of the patents. For example, claim 4 of the '916 Patent limits the claimed sequence to a "Zadoff-Chu" sequence. As the patent specification

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discusses, other sequences were known and utilized in the prior art, such as Hadamard sequences or GCL CAZAC sequences, *see* D.I. 1-1 at 1:26-42, and these sequences are not preempted by claim 4. Further, claim 5 of the '916 Patent specifies that the transmitted sequence is a "reference signal sequence," further limiting the claimed sequence from other sequence types. Similarly, claim 2 of the '481 Patent specifies that the claimed sequence is a CAZAC sequence, as opposed to the Walsh sequences used in prior art methods. *See* D.I. 1-5 at 1:57-67. The Defendants have provided no meaningful analysis of these dependent claims and they fail to meet their burden to show invalidity by clear and convincing evidence. *See JSDQ Mesh Techs. LLC v. Fluidmesh Networks, LLC*, No. 16-cv-212-GMS, 2016 U.S. Dist. LEXIS 119811, at *7-8 (D. Del. Sept. 6, 2016) (denying § 101 motion for failure to meaningfully analyze each of the claims).

3. The claims of the '916 and '481 Patents transform the inventions and override the routine and conventional use of the claimed components.

As shown above, the '916 and '481 Patents are not directed to an abstract idea, and the Court need not proceed to step two of the *Alice* analysis. *See Enfish*, 822 F.3d at 1339. Even if this Court concluded that one or more of the claims were an abstract concept, the claims include "inventive concepts" sufficient to "transform the nature of the claim" into a patentable invention. *See Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 132 S. Ct. 1289, 1294-97 (2012). In addressing the second step in the *Alice* analysis, the Court should consider the elements in the claims "both individually" and "as an ordered combination" to determine whether the elements transform the claim into a patentable invention. *See, e.g., Alice*, 134 S. Ct. at 2355.

The Defendants have failed to show that the claims are invalid under step two because the claimed inventions satisfy the machine-or-transformation test and overcome the routine and conventional use of the claimed components. The machine-or-transformation test "can provide a 'useful clue' in the second step of the Alice framework." *Ultramercial Inc. v. Hulu, LLC*, 772

F.3d 709, 716 (Fed. Cir. 2014) (citations omitted). The test is satisfied if a process (1) is "tied to a particular machine or apparatus," or (2) "transforms a particular article into a different state or thing." *SiRF Tech., Inc. v. Int'l Trade Comm'n*, 601 F.3d 1319, 1332 (Fed. Cir. 2010).

The '916 and '481 Patents satisfy both prongs of this test. For a machine to "impose a meaningful limit on the scope of a claim, it must play a significant part in permitting the claimed method to be performed." *SiRF Tech.*, 601 F.3d at 1333. In *SiRF Tech.*, the Federal Circuit upheld patent claims under § 101 directed at methods for calculating GPS positions in GPS receiver units. *Id*. Despite using mathematical formulas to calculate GPS locations with prior art equipment, the court found "the use of a GPS receiver is essential to the operation of the claimed methods." *Id*. Because "the methods at issue could not be performed without the use of a GPS receiver," the claims were tied to a particular machine and thus were patent eligible. *Id*. at 1332.

Similar to the GPS components of *SiRF Tech.*, the method claims of the '916 and '481 Patents are tied to transmitting code sequences in wireless communication systems and the apparatus claims require specific structures, referred to as a "code sequence generation unit," "preamble generation unit," "transmitting unit" or "transmission unit," essential to generate and transmit the code sequences. The '481 Patent is even narrower, claiming a specific transmission over a random access channel of a specific code sequence, the preamble sequence. The Defendants urge the Court to ignore these claim limitations because they were "conventional and generic structures and functionality" known in the art. The Defendants again misconstrue both the claims and the case law. The claimed transmission steps and components do not "function solely as . . . obvious mechanism[s] for permitting a solution to be achieved more quickly." *See id.* at 1333. Rather, they are essential to the inventors' specific solution to the prior art problems—transmitting the improved sequences in the transmission steps or using the claimed

transmitters improves reception of the transmitted sequences, providing tangible benefits to the wireless communication system and transforming the conventional components beyond their routine function in the prior art. *See DDR Holdings*, 773 F.3d at 1259. Thus, the claims are tied to these specific transmission limitations and are patent eligible under step two. Moreover, it is black letter law that "[a] new combination of steps in a process may be patentable even though all the constituents of the combination were well known and in common use before the combination was made." *Mayo*, 132 S. Ct. at 1298 (quoting *Diehr*, 450 U.S. at 188). By ignoring well-known limitations, the Court will never find combinations for technology patents eligible under § 101, and the Defendants cite no cases that support this broad and sweeping proposition.

The cases cited by the Defendants finding abstract ideas invalid when applied to generic systems are clearly distinguishable from the claims at issue here. For example, in *TLI*, the Federal Circuit found that conventional components such as a "telephone unit" and a "server" did not save the claims because "the specification makes clear that the recited physical components merely provide a *generic* environment in which to carry out the abstract idea of classifying and storying digital images in an organized manner." 823 F.3d at 611, 614-15. (emphasis added). These *generic* components add nothing more than simply a *generic* medium to apply an abstract idea, which could be applied to many different *generic* mediums. In *TLI*, the generic medium was "a telephone system," but it could just have easily have been any generic computer medium, such as the generic computer of *Alice* used to apply the abstract idea of intermediated settlement. *Id.* at 615; *see also buySAFE, Inc.*, 765 F.3d at 1355 (guaranteeing online commercial transactions limited to a generic computer was not inventive); *OpenTV, Inc.*, 2015 U.S. Dist. LEXIS 44856 at *15 (limiting the abstract idea of associating confidential information with unique identifiers was not inventive because the patent "does not claim a

solution to a problem that arose uniquely in the context of interactive television networks").

These cases all have one factor in common: the conventional components were generic systems such that multiple patents on the abstract idea could be filed, each drafted in a manner to save patent eligibility on the abstract idea limited to the generic system. In this case, however, the problems addressed by the patents arose specifically in the field of wireless communications. The conventional components described by the patents do not function as a generic medium to apply an abstract idea—instead, the claims use the components as a necessary and essential function to solve specific prior art problems with specific implementations of the claimed code sequences. Similar to the claims this Court found inventive in *Ricoh Americas Corp.* and *Improved Search, LLC*, the '916 and '481 Patents do not claim the routine and conventional use of wireless telecommunication systems, but instead claim a patentable improvement thereof.

4.   Alternatively, questions of fact preclude invalidity under Rule 12 at step two.

If the Court finds that the patents are directed to an abstract idea, this Court must accept the well-pleaded factual allegations in the complaint as true and deny the Defendants' motion. *See* D.I. 1 ¶¶ 24-32, 51-60. As this Court has remarked in *Ricoh*, the question under step two of *Alice* is whether the claims are "innovative enough to 'override the routine and conventional' use of the computer," which involves issues of fact and "is more appropriately addressed after discovery in the context of a motion for summary judgment." 2016 U.S. Dist. LEXIS 36875 at *16. At step two, factual issues regarding whether the claimed code sequences override the routine and conventional use of the claimed components preclude invalidity.

VI.   <u>CONCLUSION</u>

The Defendants have failed show by clear and convincing evidence that all of the claims of '916 and '481 Patents are invalid under § 101. As such, Evolved Wireless respectfully requests that the Court deny Defendants' motion with prejudice.

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Respectfully submitted,

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